

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

SAINT LAWRENCE COMMUNICATIONS §
LLC, §
Plaintiff, § Case No. 2:16-cv-00082-JRG
v. § Jury Trial Demanded
APPLE INC., AT&T MOBILITY LLC, §
and CELLCO PARTNERSHIP D/B/A §
VERIZON WIRELESS, §
Defendants. §
§
§

**PLAINTIFF SAINT LAWRENCE COMMUNICATIONS LLC'S
REPLY CLAIM CONSTRUCTION BRIEF**

In its Opening Brief, SLC proposed constructions for the seven disputed terms that are based on the patent specifications and the claim language. In contrast, Apple’s claim construction positions conflict with the disclosures and preferred embodiments of the asserted patents. For the reasons explained below, the Court should reject Apple’s positions and adopt SLC’s constructions.

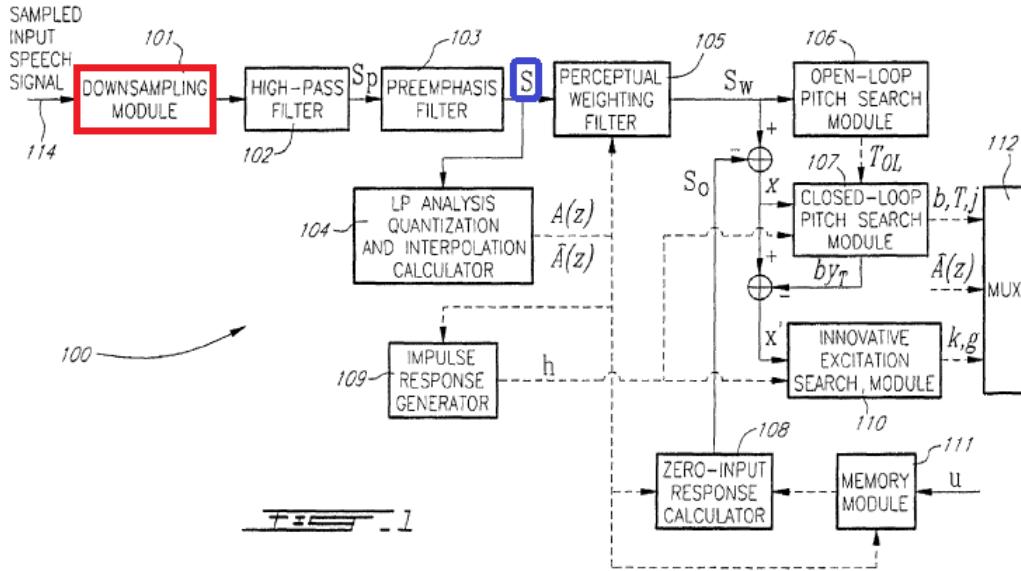
A. “[synthesized] [weighted] wideband [speech] signal”

SLC’s Construction	Defendants’ Construction
No construction is necessary. Alternatively: “a [synthesized] [weighted] [speech] signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of approximately 50-7000 Hz”	“a [synthesized] [weighted] [speech] signal that spans a wider bandwidth than traditional telephone signals and that has a frequency range of 50-7000 Hz sampled at 16000 samples/sec”

In its response, Apple contends that “wideband” requires “not only a specific bandwidth, but also a specific sampling rate.” *See* Dkt. 109 at 4. Apple further contends that “a wideband signal that is intentionally ‘down-sampled’” is not a wideband signal under the patent because “[t]he specification does not refer to the down-sampled signal as a wideband signal.” *See id.* Apple is incorrect. Specifically, Apple overlooks the claim language and the preferred embodiment, which down-samples from 16,000 Hz to 12,800 Hz (*i.e.*, samples/sec). As detailed below, the patents explicitly refer to such down-sampled signals as “wideband signals.”

1. The Preferred Embodiment Down-Samples to 12.8 kHz.

Under the preferred embodiment, the input signal “is down-sampled from 16 kHz to around 12.8 kHz.” *See, e.g.*, Ex. C at 2:48–49. This down-sampling is reflected in Figure 1 of the patents, which is the “block diagram of a preferred embodiment of the wideband encoding device.” *See, e.g., id.* at 5:57–58. As shown in Figure 1 below, the first module in the preferred embodiment is “downsampling module 101” (shown in red). In this preferred embodiment, “the sampled speech signal 114 is down-sampled in a down-sampling module 101. For example, ***the signal is down-sampled from 16 kHz down to 12.8 kHz.***” *See, e.g., id.* at 8:31–34 (emphasis added).

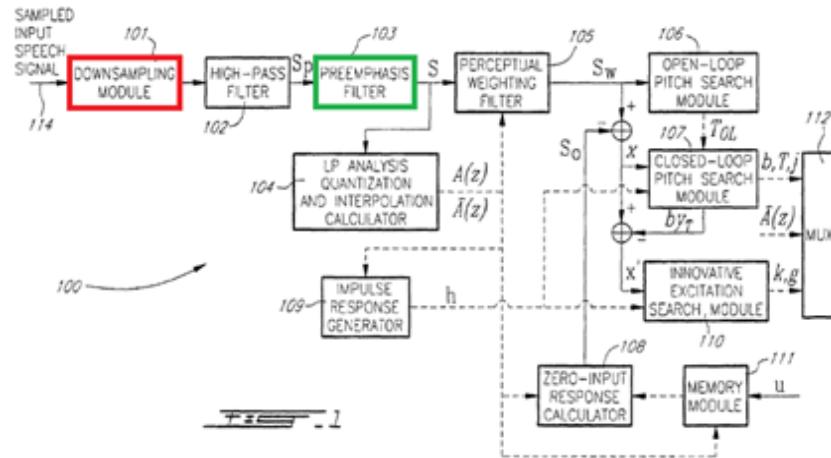


As a result, *all* of the modules in the encoder that come after downsampling module 101 process a signal that has been down-sampled to 12.8 kHz. For example, signal “S” in Figure 1 (shown in blue) is defined in the patent as the “wideband signal input speech vector (*after down-sampling, pre-processing, and preemphasis*).” *See, e.g., id.* at 7:58–59 (emphasis added).

2. The Patents Refer to Down-Sampled Signals as “Wideband” Signals.

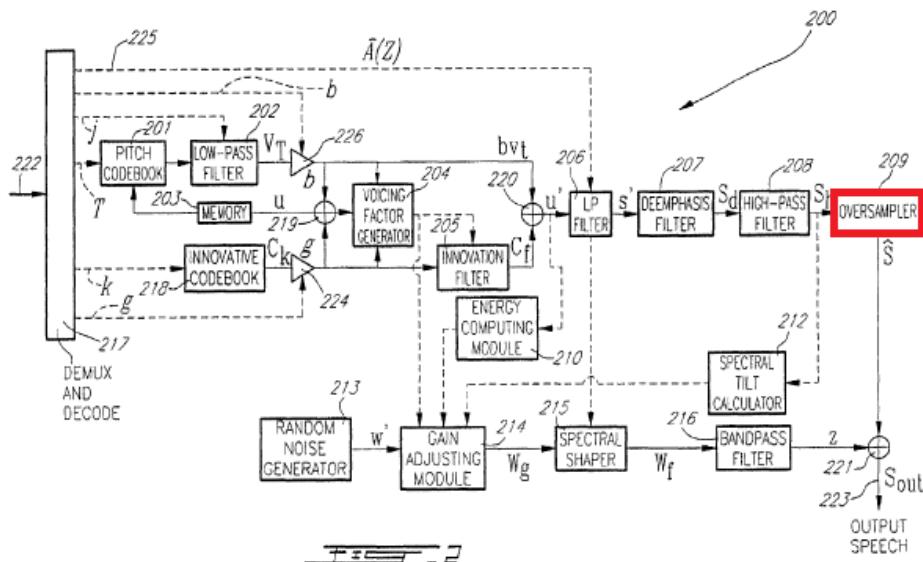
Down-sampled signals are explicitly referred to as “wideband” signals in the patents. For example, signal “S” in Figure 1 above (shown in blue) is defined as the “*wideband signal* input speech vector (*after down-sampling, pre-processing, and preemphasis*).” *See, e.g., id.* at 7:58–59 (emphasis added). Thus, down-sampled signal “S” is a wideband signal. In response, Apple makes the conclusory assertion that this is “one of many interpretations of a single ambiguous quote,” while ignoring the other examples from the claims. *See Dkt. 109 at 6.*

For example, claim 8 of the ’524 Patent recites “filtering *the wideband speech signal* to produce a preemphasised signal with enhanced high frequency content.” *See Ex. B at 19:10–11.* As shown in Figure 1, the wideband speech signal is filtered by “preemphasis filter 103” (shown in green). *See id.* at 8:10–11.



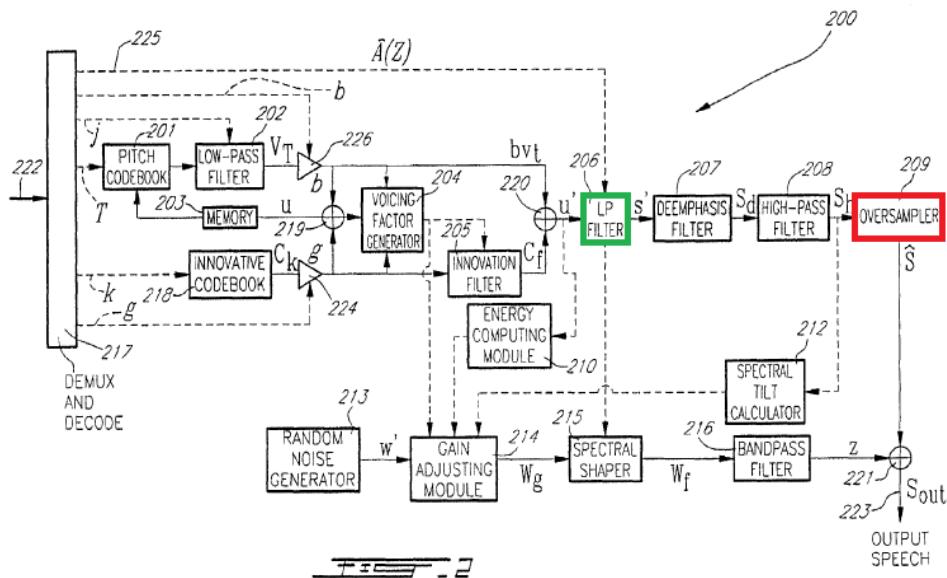
Because of downsampling module 101 (shown in red), this “wideband speech signal” of claim 8 is down-sampled from 16 kHz to 12.8 kHz under the preferred embodiment. Thus, “filtering the wideband speech signal” is performed on a 12.8 kHz wideband speech signal.

This is also true for operations performed by the claimed decoder. Figure 2 of the asserted patents is the “block diagram of a preferred embodiment of the wideband decoding device.” See, e.g., Ex. C at 5:59–60. As shown in Figure 2 below, the last module is “oversampler 209” (shown in red). This “over-sampling module 209 conducts the inverse process of the down-sampling module 101 of Fig. 1. In this preferred embodiment, *oversampling converts from the 12.8 kHz sampling rate to the original 16 kHz sampling rate.*” See, e.g., Ex. C at 17:49–52.



As a result, *all* of the modules in the decoder that come before oversampler 209 process a signal that was previously down-sampled to 12.8 kHz during encoding. For example, the decoder in claim 1 of the '802 Patent requires “receiving an encoded version of a wideband signal *previously down-sampled* during encoding.” *See id.* at 19:57–59 (emphasis added). Thus, the received “wideband signal” is a down-sampled signal.

The other elements of claim 1 further confirm that down-sampled signals are wideband signals. Claim 1 of the '802 Patent also recites a linear prediction filter for filtering the excitation signal "to thereby produce a synthesized wideband signal." *See id.* at 20:5–7. The claim then recites "an oversampler responsive to said synthesized wideband signal for producing ***an oversampled signal version of the synthesized wideband signal.***" *See id.* at 20:7–10 (emphasis added). As explained above, "oversampling converts ***from the 12.8 kHz sampling rate*** to the original 16 kHz sampling rate." *See, e.g., id.* at 17:49–52. This means that the "synthesized wideband signal" produced by the linear prediction filter has a sampling rate of 12.8 kHz in the preferred embodiment. *See id.* at 17:50–52. This is confirmed by Figure 2, which shows that the linear prediction filter—LP filter 206 (shown in green)—comes ***before*** oversampler 209:



As a result, the “synthesized wideband signal” produced by LP filter 206 has not yet been oversampled “from the 12.8 kHz sampling rate to the original 16 kHz sampling rate.” *See, e.g., id.* at 17:49–52. Apple’s argument that the embodiment’s description “does not include ‘a synthesized **wideband** signal’” is irrelevant. *See* Dkt. 109 at 7. The ’802 Patent uses the term “wideband” in the claim itself to refer to the signal produced by LP filter 206, and Apple cannot—and does not—argue that this “synthesized wideband signal” is not a down-sampled signal.

3. Apple’s Construction Reads Out the Preferred Embodiment.

Apple’s construction contradicts the patents and impermissibly reads out the preferred embodiment. The Federal Circuit has repeatedly held that an interpretation that excludes a preferred embodiment “is rarely, if ever, correct and would require highly persuasive evidentiary support.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996); *Globetrotter Software, Inc. v. Elan Comp. Group, Inc.*, 362 F.3d 1367 (Fed. Cir. 2004). Apple has not offered any evidentiary support that justifies reading out the preferred embodiment. Instead, Apple’s arguments rely on a single passage from the patents that merely discusses “wideband speech/audio applications” in general. *See* Dkt. 109 at 4. This passage does not define the term “wideband” as used in the patent claims nor purport to read out the patentees’ preferred embodiment.

Additionally, the passage is consistent with down-sampled wideband signals. The passage states that “[i]n wideband speech/audio applications, the sound signal is band-limited to 50–7000 Hz and sampled at 16000 samples/sec.” *See id.* As discussed above, the preferred embodiment of the claimed encoder down-samples the input signal “**from 16 kHz** down to 12.8 kHz.” *See, e.g., Ex. C at 8:31–34* (emphasis added). Conversely, the preferred embodiment of the claimed decoder “converts from the 12.8 kHz sampling rate **to the original 16 kHz sampling rate**” at the end of the decoding process. *See, e.g., id.* at 17:49–52 (emphasis added). As a result, the final signal is outputted at 16000 Hz in the preferred embodiment, consistent with the cited passage.

4. Apple’s Construction Renders the Claims Internally Inconsistent.

Apple also seeks to improperly apply its restrictive construction to *all* instances of the term “wideband,” which would render certain claims internally inconsistent. For example, as discussed above, claim 1 of the ’802 Patent requires filtering the excitation signal “to thereby produce a synthesized wideband signal.” *See* Ex. C at 20:5–7. The claim then recites “an oversampler responsive to said synthesized wideband signal for producing *an over-sampled signal version of the synthesized wideband signal.*” *See id.* at 20:7–10 (emphasis added). However, under Apple’s construction, the “synthesized wideband signal” must be sampled at 16 kHz. This is inconsistent with the subsequent “oversampler” element, which oversamples the “synthesized wideband signal.” The oversampler cannot logically oversample this synthesized wideband signal if it is already sampled at “the original 16 kHz sampling rate.” *See, e.g., id.* at 17:49–52.

5. Apple’s Extrinsic Sources Do Not Outweigh the Intrinsic Evidence.

Lastly, none of Apple’s extrinsic sources define the term “wideband” in a way that would disclaim signals down-sampled to 12.8 kHz or otherwise require “a frequency range of 50-7000 Hz.” Accordingly, these extrinsic sources fall short of the “highly persuasive evidentiary support” required to read out a preferred embodiment. *See Vitronics Corp.*, 90 F.3d at 1583.

In the Court’s claim construction order from related Case No. 2:15-cv-349, the Court rejected a similar attempt by defendants to require wideband signals to have a “frequency range of 50–7000 Hz.” *See* Case No. 2:15-cv-349, Dkt. 236 at 107. In rejecting defendants’ proposed construction, the Court noted that “[a]s to whether a ‘wideband’ signal necessarily extends to 7000 Hz, the Background of the Invention of the ’802 Patent discloses that down-sampling may ‘reduce[] . . . signal bandwidth below 7000 Hz.’” *Id.* at 110. For the same reasons, the Court should reject Apple’s attempt to read out down-sampled wideband signals.

B. “fixed denominator”

SLC’s Construction	Defendants’ Construction
No construction is necessary. Alternatively: “a denominator that does not vary in time with the LP parameters a_i ”	“a denominator that does not vary in time with the LP parameters a_i ”

Because “fixed denominator” appears virtually verbatim in the AMR-WB standard, persons of ordinary skill in the art readily understand the term’s meaning. *See Ex. J at SL00000021* (specifying use of “a modified filter $W(z)$ by fixing its denominator”). Additionally, a specific construction for “fixed denominator” increases the risk of Jury confusion. Instead of evaluating a two-word term that is commonly used in the art, the Jury would be required to evaluate a much longer construction, adding unnecessary layers of analysis to the infringement inquiry.

Although no construction is necessary, to the extent the Court seeks to adopt a specific construction, SLC submits that also including the example recited in the ’524 Patent of a “perceptual weighting filter having a fixed denominator” will help the Jury to evaluate whether a filter has “a denominator that does not vary in time with the LP parameters a_i .¹” This perceptual weighting filter has the form: $W(z) = A(z/\gamma_1)/(1 - \gamma_2 z^{-1})$ where $0 < \gamma_2 < \gamma_1 \leq 1$ and provides a helpful example of a filter with a fixed denominator. *See Ex. B at 9:38–45.*

C. “A [device/method] for enhancing periodicity of an excitation signal produced in relation to a pitch codevector and an innovation codevector for supplying a signal synthesis filter in view of synthesizing a wideband speech signal”

SLC’s Construction	Defendants’ Construction
This term is the preamble to the claims of the ’805 Patent and is not limiting.	“Preamble is limiting”

As explained in SLC’s Opening Brief, the claims each define a structurally complete invention in their bodies and use the preamble only to state the intended purpose of the invention. Apple’s suggestion that the preamble is limiting because it forms the antecedent basis for three

terms within the body does not change this fact. This Court previously rejected the argument that a preamble must be limiting because it provided the antecedent basis for some claim terms. *See LBS Innovations LLC v. BP America, Inc.*, 2013 WL 3187167, *17 (E.D. Tex. Jun. 20, 2013) (noting that the preamble is still “merely a statement of purpose or intended use”).

In *LBS Innovations*, this Court also held that “[o]nly clear reliance on the preamble during prosecution to distinguish the claimed invention over prior art transforms the preamble into a claim limitation.” *Id.* at *19 (rejecting argument that the preamble was limiting merely because it was discussed in the patent’s Notice of Allowability). Similarly, the prosecution history cited by Apple has nothing to do with distinguishing the claims over any prior art, and Apple does not contend otherwise. *See id.* (rejecting defendants’ prosecution history argument because “[d]efendants have failed to establish a ‘clear and unmistakable’ disclaimer of claim scope”).

In view of the above, SLC respectfully submits that the preamble is not limiting.

D. “high frequency content” and “low frequency portion”

SLC’s Constructions	Defendants’ Constructions
No constructions are necessary.	Both terms are indefinite

Apple argues that the terms “high frequency content” and “low frequency portion” are indefinite because the specification contains “conflicting teachings.” This is incorrect. Despite the fact that these terms come from two different patents, each claiming different inventions, Apple assumes that the term “high frequency content” *from the ’524 Patent* necessarily defines—through negative implication—the term “low frequency portion” *from the ’805 Patent*. See Dkt. 109 at 17. However, Apple provides no evidence from the intrinsic record that supports this assumption.

The “high frequency content” element in claims 1 and 8 of the ’524 Patent relates to the output of the preemphasis filter, and the application of the disclosed preemphasis filter defines the scope of “high frequency content” with reasonable certainty. *See Ex. B at 7:66–8:11*. In contrast,

the “low frequency portion” element in claims 1 and 11 of the ’805 Patent relates to the output of the innovation filter, and the application of the disclosed innovation filters define the scope of the “low frequency portion” with reasonable certainty. *See* Ex. A at 14:30–38 (reciting “[s]uggested forms for innovation filter 205”). Apple’s conflation of the two patents and its unsupported assumptions as to the terms’ meanings is not enough to meet its burden on indefiniteness.

E. “wherein γ_2 is set equal to μ ”

SLC’s Construction	Defendants’ Construction
No construction is necessary.	Indefinite

Apple is not arguing that it does not understand the meaning of the term “wherein γ_2 is set equal to μ .” This exact term is found in other claims that Apple concedes are definite. Apple also is not arguing that the meaning of the term “ μ ” is not clear from the patent specification and the surrounding claim language. The patent specification states that “ μ ” is a “preemphasis factor.” Ex. B at 7:67–8:5; 18:50. Thus, the term requires that the value γ_2 is set equal to a preemphasis factor μ . Instead, Apple’s complaint is essentially that the claim *itself* does not provide a specific definition of the term “ μ .” However, the purpose of claim construction is to construe claim terms in view of the patent as a whole. As a result, the Court should reject Apple’s argument.

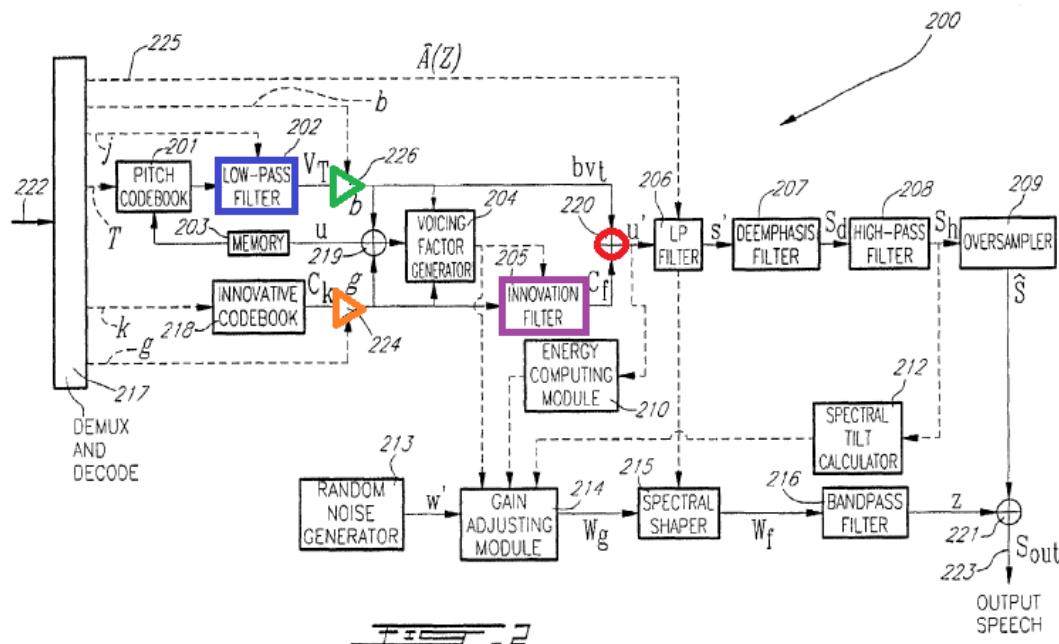
F. “said excitation signal”

SLC’s Construction	Defendants’ Construction
No construction is necessary.	“the excitation signal produced by combining said pitch codevector and said innovative codevector in step (d)/[step (iv)]”

For “said excitation signal,” Apple merely rearranges the existing words of the claim without providing any clarification of its meaning or articulating the substance of Apple’s alleged dispute. Indeed, by Apple’s own admission “[t]he plain claim language resolves” any alleged dispute over the limitation, and thus no construction should be necessary. Dkt. 109 at 23.

Additionally, SLC notes that this claim term recently became the subject of briefing in the

related case. See Case No. 2:15-cv-349, Dkt. 275 at 9–11 (explaining how defendants' interpretation of the claim term reads out the preferred embodiment). Specifically, as illustrated below in Figure 2, combiner circuit 220 (shown in red) combines a pitch codevector that is filtered by low-pass filter 202 (shown in blue) and amplified by amplifier 226 (shown in green) with an innovative codevector that is similarly amplified by amplifier 224 (shown in orange) and filtered by innovation filter 205 (shown in purple):



In the related case, the defendants have argued—contrary to this preferred embodiment—that the combiner circuit must combine *unfiltered* and *unamplified* codevectors.

Apple does not suggest that its construction conflicts with this disclosure, and Apple does not argue that reading out a preferred embodiment is warranted. As a result, Apple has failed to articulate a dispute that would warrant construing the term “said excitation signal” to merely rearrange the claim language. Indeed, Apple admits that its construction only “seeks to confirm the plain language.” Dkt. 109 at 22. SLC respectfully submits that confirming the plain language is best accomplished by giving “said excitation signal” its plain and ordinary meaning.

Dated: January 11, 2017

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via the Court's CM/ECF system per Local Rule CV-5(a)(3) on January 11, 2017.

/s/ Demetrios Anaipakos
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